LIST OF PREPARERS

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Principal Author	Experience	Report Topics
Laura Hicks	Planning and Project Management 16 years	Project Management, Alternatives, Coordination/Public Involvement, Project Implementation
Karl Eriksen	Hydraulic Engineering 25 years	Alternatives, Physical Resources, Navigation Practices
Geoff Dorsey	Wildlife Biology 16 years	Wildlife Resources, Mitigation
Kim Larson	Fishery Biology 25 years	Aquatic and Fishery Resources
Brian Shenk	Economics 9 years	Economics, Needs and Opportunities, Benefit Analyses
Mark Siipola	Sediment/Physical Science 20 years	Sediment Analyses, Material Disposal
Jane Bolton	Engineering Design 10 years	HTRW Investigations
Jim Fredericks	Economics 10 years	Economic Analyses
Steve Stevens	Land Use Planning, NEPA Compliance, 25 years	EIS Coordination
Ron Musser	Real Estate Appraisal 24 years	Sponsor Requirements
Lynda Walker	Cultural Resources 20 years	Cultural Resources, Native American Coordinator
Karen Bahus DBA Technical Writing & Research	Biologist/Planning 20 years	Technical Report Writing/Editing

GLOSSARY

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This glossary defines terms that are specific to the *Columbia River Channel Improvement Feasibility Report with Integrated Environmental Impact Statement.*

Advance maintenance dredging (AMD): Advance maintenance dredging provides year-round channel availability and allows an annual dredging cycle. Up to 5 feet of AMD below the design depth and up to 1-foot beyond each channel boundary was authorized for the Columbia River channel. Two feet of AMD below the design depth was authorized for the Willamette River channel.

Anadromous fish: Species of fish that migrate upstream to freshwater after spending part of their life in the ocean (saltwater). Salmon, steelhead, sturgeon, and shad are examples.

Anaerobic: A condition in which molecular oxygen is absent (or effectively so) from the environment.

Aquatic ecosystem: Any body of water, such as a stream, lake or estuary, and all organisms and nonliving components within it, functioning as a natural system.

Archaeological resources: See cultural resources.

Arthropod: An invertebrate animal with jointed legs--more specifically, a member of the phylum *Arthropoda* (over 800,000 species), which includes insects, spiders, millipedes, crayfish, and other groups of animals that are characterized by having an exoskeleton with articulation of body and appendage segments to accommodate movement.

Beach nourishment (disposal): Shoreline fills that replace eroded material are referred to as beach nourishment. See also shoreline disposal.

Bedload: Bedload is the movement of sand grains rolling and bouncing along the surface of the river bed. In sandy riverbeds, bedload transport shapes the bed into a series of sand waves. The bedload movement is generally directed downstream, but there is a small displacement towards deeper water caused by the side-slopes of the riverbed. This displacement is larger on steeper side-slopes.

Benthic: Organisms living on the bottom of the river. They include microalgae, mainly diatoms, filter feeders and detritovores. Other benthic invertebrates associated with the river include clams, mussels, oligochaetes, polychaetes, mysids, and insect larvae. Benthic infauna distribution in the river and estuary is directly related to sediment grain size and stability. Salinity is also a major factor affecting the distribution of some species.

Biodiversity: A diversity of biological organisms at the genetic, species, ecosystem, and landscape levels.

Bryophyte: A member of the phylum Bryophyta, which includes the mosses, liverworts, and hornworts, and is a primitive (non-flowering) plant characterized by the lack of true roots, stems, and leaves.

Buffer: Usually a natural area or open space used to divide two developed or developing areas.

Cape-size vessel: A type of deep-draft bulk ship carrying 100,000 to 175,000 tons.

Candidate species: Those plants and animals included in Federal Register "Notices of Review" that are being considered by the Fish and wildlife Service for listing as threatened or endangered.

Channel improvements: This term refers to channel widening or channel realignment measures to attain navigation safety.

Clamshell dredging: Clamshell dredges use a bucket operated from a crane or derrick that is mounted on a barge or operated from shore. Sediment removed by the bucket is usually placed on a barge for disposal to either an upland or in-water site. Dredged material comes up virtually *in situ,* so clamshell dredges work well in silts or contaminated material, where water entrainment is a problem.

Columbia River datum (CRD): The Columbia River navigation channel elevations are referenced to the Columbia River datum established in the 1930s. The CRD is a local datum based on observed water surface elevations during low discharge-low tide conditions.

Critical habitat: Under the Endangered Species Act, critical habitat is defined as (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a listed species, when it is determined that such areas are essential for the conservation of the species.

Cubic feet per second (cfs): A unit of measurement pertaining to flow or discharge of water. One cfs is equal to 449 gallons per minute.

Cultural resource: Evidence of human occupation or activity that is important in the history, architecture, archaeology of a community or region.

Cutline shoals: Cutline shoals form along the edges of the navigation channel where steep sided slopes of the dredge cuts cause bedload to be deflected into the channel, forming new shoals. Over time this action will cause the side-slope adjacent to a dredge cut to degrade until an equilibrium slope is re-established. In many places the side-slope degradation extends for hundreds of feet out from the navigation channel.

DMMP: Dredged Material Management Plan - The dredging and disposal plan that results from analyses conducted in the DMMS.

DMMS: Dredged Material Management Study – An analysis of dredging and disposal alternatives that address cost, engineering, and environmental factors to operate and maintain the Columbia River 40-foot navigation channel.

Deep-draft ports: Ports capable of handling up to 40-foot draft vessels. There are five deep draft ports on the lower Columbia River: Astoria, Longview, Kalama, Vancouver, and Portland.

Diking districts: Local groups that have formed to raise money to construct, operate and maintain dikes to prevent flooding by the river. Agricultural and urban developed lands along the Columbia River are generally encompassed with diking districts.

Drawdown: The distance that the water surface of a reservoir is lowered from a given elevation as water is released from the reservoir. Also refers to the act of lowering reservoir levels.

Dredging forecast: An estimated forecast of the volume needed to be dredged to maintain the 40-foot channel. The basis for the forecasts considered recent O&M dredging volumes and disposal practices, riverbed bathymetry, dredging trends, potential sediment supplies, and potential river control structures (pile dikes).

Easement: An interest or a privilege in land created by a provision in a grant or by an agreement, which confers a right upon the owner thereof to some profit, benefit, dominion, or lawful use out of or over the estate of another.

Ecosystem: The living and nonliving components of the environment which interact or function together.

Endangered species: Any species of plant or animal defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range, and published in the *Federal Register*.

Endemic species: A species that naturally occurs only within in a defined location or area.

Estuary: The part of course of a river where its current is met and influenced by the tides. For this document, the estuary was considered to extend to CRM 38.

Estuarine disposal: Disposal actions that occur in the Columbia River estuary.

Federal channel: The congressionally authorized 40-foot by 600-foot Columbia and Lower Willamette Rivers below Vancouver, Washington and Portland, Oregon.

Fill: The placement, deposition, or stockpiling of sand, sediment, or other earth materials.

Finding of no significant impact (FONSI): A document prepared by a Federal agency that presents the reasons why an action will not have a significant effect on the human environment and for which an environmental impact statement will not be prepared.

Flow: The volume of water passing a given point per unit of time. Flow is often measured in cubic feet per second.

Flowlane disposal: Disposal of dredged material in deep areas in and adjacent to the navigation channel. See in-water disposal.

Freshet: A rapid temporary rise in streamflow caused by heavy rains or rapid snowmelt.

Geomorphic: Pertaining to the form or shape of those process that affect the surface of the earth.

Habitat: The place or conditions where a plant or animal lives or can live. The plant or animal can be an individual organism, a population, or a taxonomic group. In the present context, habitat refers to conditions favorable for the indefinite survival of a given species.

Herbaceous: A plant with no persistent woody stem above the ground, with characteristics of an herb.

Hopper dredging: Removing river sediments using a ship equipped with pumps, dragheads (extendable, submersible arms) and hoppers (multi-thousand cubic yard containers). Hopper dredges are generally restricted to in-water disposal. These dredges can operate anywhere on the river and can be rapidly deployed to problem shoals. Hopper dredges are most often used on small volume sand wave shoals in the river and on larger shoals in the estuary.

Hydric soil: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.

In-water disposal: In-water disposal refers to the placement of dredged material along the riverbed in or adjacent to the navigation channel, or in designated in-water sites. Commonly referred to as flowlane disposal, it has been used throughout the river for many years. In-water disposal sites may move from year-to-year, depending on the dredging location and river depths available in the vicinity of the dredging action. In-water disposal can be utilized by hopper, pipeline, and clamshell dredges. Hopper dredges can haul material several miles to a disposal site, but are more cost effective with nearby sites. Pipeline dredges can sidecast or pump several thousand feet to in-water disposal sites. A clamshell and barge operation can move material many miles to an in-water disposal site. Disposal in sites over 50 feet deep limits the amount of sand that will return to navigation channel shoals.

Juvenile: The early stage in the life cycle of anadromous fish when they migrate downstream to the ocean.

Mainstem sediments: Columbia River mainstem sediments originate within the Columbia river in contrast to sediments entering from tributaries. They are composed of sand with typically less than 2 to 5 percent in the silt and clay size classifications.

Mitigation: The use of any or all of the following actions:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

Mollusk: An invertebrate animal that is a member of the phylum Mollusca (over 1 00,000 species), which includes gastropods (slugs, snails, and marine nudibranchs), pelycipods (freshwater and marine clams), cephalopods (squids, nautili, and octopi), and amphineurans (chitons) – all of which have a soft, unsegmented body with a muscular foot, a head with sensory organs, and a mantle that may or may not secrete a calcareous shell (slugs have a mantle but little or no shell).

Monitoring: A process of collecting information to evaluate if objective and anticipated or results of a management plan are being realized or if implementation is proceeding as planned.

National ambient air quality standards (NAAQS): Standards set by the Environmental Protection Agency that limit the concentrations of certain air pollutants that endanger public health or welfare.

National Environmental Policy Act (NEPA): An Act passed in 1969 to declare a national policy for all federal actions. The NEPA process is intended to help public officials make better decisions based on an understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. The Council on Environmental Quality establishes regulations to achieve this purpose (40 CFR 1500-1517).

Native species: Species that naturally inhabit an area.

Panamax vessel: A type of deep-draft bulk carrier ship of 50,000 to 80,000 tons.

Pile dike: A pile dike consists of two parallel rows of piling that are tied together and extend 300 to 500 feet into the river.

Pile dike fields: A pile dike field consists of several pile dikes spaced about 1,200 to 1,500 feet apart. Within the dike field, current velocities are slowed and flow is deflected away from the river bank. Pile dike fields have been built along the river to concentrate flow and stabilize the channel. The dike fields slow the current near the shore, reducing the erosion potential. Most shoreline disposal sites are provided some degree of protection from river erosion by pile dike fields.

Pipeline dredging: Pipeline dredges are vessels equipped with extendable and submersible cutterheads and pumps. Material removed from a shoal by the cutterhead is pumped through a pipeline to a disposal location. Pipeline dredges are typically used for the large cutline shoals and areas with multiple sand wave shoals.

Rare plant species: Used in a generic sense to refer to various categories of sensitive plants cited in federal and state programs.

Real property: All interests, benefits, and rights inherent in the ownership of physical real estate; the bundle of rights with which the ownership of the real estate is endowed.

Record of decision (ROD): A document separate from but associated with an environmental impact statement that states the management decision, identifies all alternatives including both the environmentally preferable and preferred alternatives, and states whether all practicable means to avoid environmental harm from the preferred alternative have been adopted, and if not, why not.

Restoration (wetlands): A human activity that converts an area that was formerly a wetland back into a wetlands This definition presumes that the area to be restored no longer qualifies as a wetland because of past activities, alterations, or catastrophic events.

Riparian area: The area immediately adjacent to streams, ponds, lakes, and wetlands that directly contributes to the water quality and habitat components of the water body. This may include areas that have high water tables and soils and vegetation that exhibit characteristics of wetness, as well as upland areas immediately adjacent to the water body that directly contribute shade, nutrients, cover, or debris, or that directly enhance water quality within the water body.

Riverine environment: For this study, the riverine environment refers to the portion of the Columbia upstream of river mile 38 where the river is confined to a narrower path than in the estuary.

Salmonids: Refers to fish of the family *Salmonidae*.

Sand waves: Waves made of sand. They cover the riverbed in the Columbia, and are typically 4 to 8 feet high and 300 to 400 feet long. The river discharge and bedload transport affect sand wave movement. When the river discharge is less than 300,000 cfs, sand waves move only a few feet per day. However, when the discharge exceeds 400,000 cfs, sand wave movement can reach 20 feet per day or higher.

Seasonally saturated soil: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions.

Secretary: The Secretary of the Army.

Sediment Yield: The quantity of soil, rock, particles, organic matter, or other dissolved or suspended debris is transported through a cross-section of stream in a given period. Measured in dry weight or by volume. Consists of dissolved load, and bed load.

Sensitive plant species: Plant species that are (1) native to the Columbia Basin and vicinity, (2) listed as endangered or threatened by federal or state endangered species acts, or (3) listed as endangered, threatened or sensitive by the Oregon or Washington Natural Heritage Program.

Sensitive Species: Those species that (1) have appeared in the *Federal Register* as proposed for classification and are under consideration for official listing as endangered or threatened species, or (2) are on an official state list, or (3) are recognized as needing special management to prevent their being placed on federal or state list.

Sensitive wildlife species: Animal species that are (1) listed as endangered or threatened pursuant to federal or state endangered species acts, (2) listed as endangered, threatened, sensitive, or candidate by the Washington Wildlife Commission, (3) listed as sensitive by the Oregon Fish and Wildlife Commission, or (4) considered to be of special interested to the public.

Ship wakes: Wave action originating from passage of a ship that strikes the shoreline. Ship wakes and wind waves can erode exposed sandy banks, but only move sediment within the shallow water zone near the shore.

Shoreline disposal: Material that is dredged and pumped onto shallow water and beach areas along the lower river. Shoreline disposal is done primarily with pipeline dredges.

Smolt: A juvenile salmon or steelhead migrating to the ocean and undergoing physiological changes to adapt its body from a freshwater to a saltwater environment.

Spawning: The releasing and fertilizing of eggs by fish.

Species: A group of organisms that can interbreed in nature (a common gene pool that is biologically isolated from closely related species), and is designated by an available and valid scientific name.

Special habitat area: Wetlands, mudflats, shallow water, and riparian vegetation that have high values for waterfowl, shorebirds, raptors, songbirds, upland game, and reptiles.

Streams: Areas where surface water produces a defined channel or bed, including bedrock channels, gravel beds, sand and silt beds, and defined-channel swales. The channel or bed does not have to contain water year-round. This definition is not meant to include irrigation ditches, canals, storm or surface water runoff structures, or other artificial watercourses unless they are used to convey streams naturally occurring prior to construction of such watercourses.

Taxon: A category in scientific classification system, such as class, family, or phylum.

Thalweg: The line following the deepest part or middle of the bed or channel of a river.

Threatened species: Plant or animal species likely to become endangered species throughout all or a significant portion of their range within the foreseeable future.

Tributary fish habitat: Streams that are used by anadromous or resident fish for spawning, rearing and/or migration.

Upland: Any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet to elicit development of vegetation, soils, and/or hydrologic characteristics associated with wetlands.

Underkeel clearance: The distance between the ship hull and the river bottom.

Water quality: The chemical, physical, and biological characteristics of water.

Watershed: The drainage basin contributing water, organic matter, dissolved nutrients, and sediments to a stream or lake.

Wetlands: Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. This does not include riparian areas, rivers, streams, and lakes.

Xeric: dry

INDEX

INDEX

Topics are referenced to section numbers in the report.

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LITERATURE CITED

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EXHIBIT A
CORRESPONDENCE

EXHIBIT B
SCOPING DOCUMENTATION

EXHIBIT C
FISH AND WILDLIFE COORDINATION ACT REPORT

EXHIBIT D
SECTION 103 EVALUATION

EXHIBIT E
SECTION 404(B)(1) EVALUATION

EXHIBIT F
COASTAL ZONE MANAGEMENT CONSISTENCY DETERMINATION

EXHIBIT G
BIOLOGICAL ASSESSMENT
WILDLIFE

EXHIBIT H
BIOLOGICAL ASSESSMENT
FISH